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ABSTRACT

The first report in this research monograph, "Black English as an Instructional Tool for Teaching Arithmetic," states that black elementary school students in a suburban school improved in ability to do math problems after a 6-week program in which Black English and easier-to-read words were used in the problems. At the same time, a control group of white students regressed in math skills when taught from the conventional textbook. "The effects of a University-based Tutoring Program on Reading Skills of Elementary pupils" is the title of the second report which describes the success of elementary education majors from Florida A & M College in improving reading performance of black elementary school children they tutored for two months. This was seen as a solution to the manpower shortage in the schools and a way to give potential teachers useful experiences. The third report, "A Study of the Effect of the Thirteen-College Curriculum Program Physical Science Course on the Scientific Attitude of College Students," reports that this particular course stimulated more emotional, intellectual, and total favorable attitudes toward science in college freshmen than a traditional science program. Males and females were equally responsive to the more innovative course. The last report, "Teacher Education: A Status Report," surveys black teacher education colleges and compares them to white colleges in terms of characteristics such as curricula, educational concepts, field experiences offered, use of behavioral objectives and individualized instruction, and accreditation. (CD)

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RESEARCH MONOGRAPH

Edited by

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COLLEGE OF EDUCATION

FLORIDA A & M UNIVERSITY

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FOREWORD

For the past five years, the Southern Regional Education Board (SREB) has provided the impetus for teacher educators to engage in a variety of meaningful activities. The Board's emphasis upon research has resulted in the enhancement of many teacher education programs. This monograph is a manifestation of such an emphasis and we hope that readers will find its contents useful and that this will provide documentation of some programs that could be implemented by other interested colleges and universities.

P.B.M.

This public document was promulgated at a cost of $1.696 per copy to inform the public of the College of Education programs.

"BLACK ENGLISH" AS AN INSTRUCTIONAL TOOL FOR TEACHING ARITHMETIC

by William Cutliff

The study reported in this monograph is designed to provide data regarding the untested assumptions that black children from hardcore poverty areas do exhibit dialect interference problems when reading, and that these problems permeate and hamper competence in the solution of word problems in mathematics.

Introduction

In the spring of the year 1971, the Pinellas County Board of Public Instruction was given a mandate by the Federal Courts to desegregate its schools in ratios that paralleled its black-white population at all levels, kindergarten through grade twelve, by September of the 1971-72 term. This desegregation was to be accomplished even if it meant busing inner-city blacks into suburban white schools. In compliance with the Federal mandate, the Board embarked upon a mass busing program in September, 1971. Suburban whites were riding to inner-city schools and inner-city blacks were riding to suburban schools.

For whatever multitude of reasons, the majority of black youths attending suburban schools is experiencing serious difficulty in mastering the traditional reading curriculum offered them. As has been dramatically documented by the Coleman Report (1966), the black child progressively falls behind the white student in reading ability as well as in verbal and mathematical ability with each grade completed. In support of this point Fillmer and Griffith (1971) stated that one of the greatest differences that research has discovered between the disadvantaged and the non-disadvantaged pupil is the language deficit of the disadvantaged pupil. This deficit is cumulative in that it grows more severe each year that the pupil is in school.

In the past few years, an increasing body of literature has appeared that deals directly with the hypothesized linguistic differences of a dialectal nature that affects the success with which black children learn to read. Linguists have maintained that the differences between so-called black English and standard American

English are great enough that black children will experience an interference effect when attempting to read standard American English texts (1972).

Willmon (1971), after considerable research, found that the number of new arithmetic terms introduced in grades one, two and three was 473. Secondly, the number of arithmetic terms introduced appears great for textbooks to be sole teaching vehicles in classrooms and is especially large for average readers whose total vocabulary is about 4,000 words by fourth grade. Vocabulary repetition may be insufficient and could be crucial for arithmetic vocabulary inclusion in the reading program. These findings, coupled with the summary ideas presented by Freshour (1972), in particular, indicate that the teacher must accept the dialect of the child. The teacher should help the child to see that different dialects are appropriate in different situations. Similarly, there are times to use "Standard English" further, the transfer to "Standard English" might be further delayed if certain concepts could be handled better initially in a child's own dialect.

PURPOSE OF THE STUDY

The purpose of this study was to investigate the differences in comprehensibility of textbook word problems and word problems written in so-called "Black English" as it affects the achievement of black students.

A number of social scientists have attempted to explain why it is the case that black children fare so poorly in the present system of public education. A variety of theories has emerged. Though it is not the purpose of this paper to seek to substantiate any of these theories, it would be beneficial as Rist (1970) suggests to examine a few currently held theories to serve as a backdrop against which to evaluate research findings to be presented later in this paper.

REVIEW OF RELATED LITERATURE

The first of two major theories finds its clearest expression in the works of Deutsch (1963) who argues that the nexus of the problem of the non-achievement of black students in urban schools is derived from their early years before formal education. This theoretical perspective is best known as "Deprivation Theory." Succinctly, Deutsch contends that because of insufficient stimulation in the early years of life ("input experiences"), there is a thwarting of normal development and a restriction in "output experiences." This lack of early intellectual and cultural stimulation restricts the child's normal development including the skills necessary for academic performance.

The second of the theoretical approaches was first formulated in the writings of Kenneth Clark. It is known as the "Expectation Theory" and has been supported in findings of Rosenthal and Jacobson (1968) and most recently, the findings of Rist (1970). These findings suggest that the decrease is due to neither genetic nor environmental factors, but to teachers' expectations that the students will do inferior work, resulting in the confirmation of a self-fulfilling prophecy."

Goodman, Labov, and Baratz have been leaders in teaching reading to children of divergent dialects; they suggest that the child expand his own language and incorporate a more formal style rather than try to replace his dialect completely.

The present study is concerned with an investigation of expanding "Black English" and incorporating a more formal style rather than replacing the dialect completely in multiplication and division word problems. The specific questions which provided focus for this study were as follows:

1. Are realistic (ethical) questions met statistically better by black students?
2. Do sixth grade black students comprehend statistically better word problems written at a lower level of reading difficulty but with the same level of mathematic difficulty?
3. Could the problems in the standard textbooks be rewritten using Black English without changing the numerical quantities involved?

NULL HYPOTHESIS

There is no significant difference in achievement of black students in solving multiplication and division word problems written in "Standard English."

SUBJECTS

The subjects in the study were twenty children enrolled in the sixth grade of a suburban school. Of the total population, ten were black students bused from an inner-city, low-income community and ten were white suburban, middle-income, neighborhood students.

Originally it had been planned to study the effects of the design over a nine-week period, but because of the instructional design of the intermediate program (modified, prescription and individualized), a six-weeks program was finally chosen. Working within a six-weeks design further restricted our scope to word problems involving the multiplication and division operations.

Current test data was based on the administration of the Pinellas County Multiplication Diagnostic Tests and Division Diagnostic Tests, in the same year as the study, were available for nineteen of the subjects. The nineteen children were found to have a percentile rank of 58 among the white students and 47 among the black students beginning the unit on multiplication and division.

DESIGN

Elementary school pupils in grade six participated in the present study. Ten black students served as the Experimental Group and ten white students served as the Control Group.

There were two pre-tests administered to all participants. These were: (1) Multiplication Diagnostic Test—Form B and Division Diagnostic Test—Form B. Tests were designed by the Department of Elementary Curriculum, Pinellas County, Florida. Subsequently the tests were scored by the present writer.

The project lasted six weeks and, for the Experimental Group, consisted of one lesson per day, five days per week for the six-week period. In all, thirty lessons were executed. The special lessons consisted of word problems on measurement, distance, money, fractions, and time which involved solution by multiplication and/or division. Problems were taken from textbooks assigned to the students and placed on ditto sheets. For each unit taught from the text, odd-numbered problems were rewritten some at a lower level of reading difficulty, others by changing a noun, an adjective, or a verb to meet "Black English" standards but, in no instance was the level of mathematical difficulty or numerical values changed.

The lessons became more difficult as the experiment progressed.

Students in the Control Group expended a similar amount of time working with the even-numbered problems (unaltered) from the same text which were placed on ditto work sheets. All procedures were carried out by the writer and these activities were the primary mathematical activities carried out during this period.

When the six-week experimental program was concluded, a twenty-five problem text—companion test was administered to all participants. Subsequently all tests were scored by the writer and data were made ready for statistical analysis.

DATA ANALYSIS

Findings of the researcher are applicable to the group studied, only, and may not be applied to, or does not describe other individuals or groups. It is a descriptive statistical analysis concerned with the numerical description of the performance of sixth graders in the solution of word problems involving multiplication and division operations.

Means, standard deviations and coefficients of correlation were obtained for multiplication and division pre-tests and post-tests.

In comparing the multiplication and division problem-solving performance of the sixth grade experimental group, the following results were forthcoming: on the pre-test the mean number attempted was 44 and the standard deviation was 6.6. Corresponding data for the post-test gave a mean of 47.6, and a standard deviation of 4.4. The mean (D-test) difference was 3.6 showing improvement in achievement. Corresponding data for the control group showed a pre-test mean of 58 and a standard deviation of 4.8. Corresponding data for the post-test gave a mean of 32.2 and a standard deviation of 3.6. The mean (D-test) difference of 25.8 revealed that there was a significant decline in skills at the end of the study.

Differences in improvement between the experimental group and the control group favored the experimental group. The control group experienced what may be termed a "regress phenomenon," actually falling behind what would have been expected of them during the period.

Two types of statistical analyses were conducted. In the first (Tables 1 and 2) each group was compared internally with itself to determine if there had bene improvement during the study. The second set of statistical measures sought to compare differences in achievement between the experimental and control groups (Table 3) on post-test.

Table 1

DESCRIPTIVE DATA FOR ACHIEVEMENT IN SOLVING MULTIPLICATION AND DIVISION PROBLEMS (N=10) EXPERIMENTAL GROUP

Variable	*Mean*	*S.D.*	*S.E.*
Pre-test	*44*	*4.8*	*1.5*
Pre-test	*47.6*	*4.4*	*1.39*

r = Significant at .05 level
r = .11 (.0438)
D-Test 3.6

Table 2

DESCRIPTIVE DATA FOR ACHIEVEMENT IN SOLVING MULTIPLICATION AND DIVISION PROBLEMS (N=10) CONTROL GROUP

Variable	*Mean*	*S.D.*	*S.E.*
Pre-test	*58*	*4.8*	*1.5*
Pre-test	*32.2*	*3.606*	*1.1*

r = Significant at .05 level
r = .18 (.714)
D Test (-) 25.8

Table 3

DESCRIPTIVE DATA OF COEFFICIENT OF CORRELATION OF ACHIEVEMENT ON POST-TEST BY EXPERIMENTAL (X) AND CONTROL (Y) GROUPS (N=10) RAW SCORE METHOD

Variable	*Mean*	*E*	E^2
Experimental Group	*47.6*	*X = 476*	*24265*
Control Group	*32.2*	*Y = 322*	*11528*

r = Significant at .05 level
r = .93 (.9258); Z = 2.79
D-Test 15.4

This study sought to establish the null hypothesis, there is no statistically significant correlation between performance in solving multiplication and division word problems of black students using "Black English" and white students using "Standard English." The treatment of data was significant at the .05 level of confidence thus, the null hypothesis is rejected.

CONCLUSION

Treatment of the available data appears to warrant the following conclusion.

The experimental procedure seemed to have a positive and significant effect on the multiplication and division word problem solving performance of the Experimental Group.

DISCUSSION

From the present study it would appear that the experimental procedures had a nominal and ephemeral effect on students' performance in solving multiplication and division word problems. Yet the real results may be successful to a larger degree than appears initially.

In retrospect it seems clear that the timing of the study was something less than desirable. Being conducted in the spring and extending until the final week of school is an aspect of faulty design and is to be avoided. All participants may have been unduly fatigued by the requirements of the regular classroom activities and the additional activities of the experiment itself. A more sensible time to initiate such a study appears to be in the fall. This timing could allow for follow-up.

It is conceivable that the wrong age-grade population was used. It may very well be that the experimental mathematics lessons require a degree of discipline and sophistication usually associated with more mature pupils. This consideration should not remain uninvestigated.

RECOMMENDATIONS FOR FURTHER STUDY

The present study was neither a complete success nor a total failure but did have some significant and positive effects on solving word problems. Future studies should incorporate considerations of:

A. A more sensible time to initiate, complete and follow up such a study;
B. The need for a change in age-grade level of the population sample:

C. Collaborating with an expert on "Black English" to insure accuracy of structure and usage.

The shortcomings of the study rest with the researcher who designed it, executed it, and assumes full responsibility for the errors.

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THE EFFECTS OF A UNIVERSITY-BASED TUTORING PROGRAM ON READING SKILLS OF ELEMENTARY PUPILS

by Robert Lemons

A problem that continues to grow in magnitude and confronts teachers daily is that of dealing effectively with the large numbers of reading disability cases which are found in most typical classrooms. Conversations with classroom teachers (both experienced and inexperienced) inevitably lead to an acknowledgement of the difficulties that one experiences in today's classrooms. Classroom teachers ask how they can teach thirty pupils, conduct thorough on-going diagnoses, locate and make available materials and activities, and still have the time to provide the type of intensive and one-to-one help that many disabled readers need? This question is one which serious teachers are asking, and are desperately searching for an answer to. As the problem appears to be worse for teachers who work in schools whose clientele is comprised primarily of students from low socio-economic-status backgrounds.

We live in a reading society and those who do not become literate are destined for failure, frustration, and maladjustment for the remainder of their lives. A number of studies indicates that failure in reading tends to contribute to juvenile delinquency. One such study was reported by Polmantier (1941) in which he found that the person with a reading disability tends also to be the person with other adjustment problems.

A pupil's success in content area courses is dependent on his skills in reading. If one reads well then he has a much better chance of mastering the concepts of the various content areas. Strang (1940) estimated that eighty to ninety percent of all study activities in typical high schools require reading. "Reading to learn" or the use of reading as a tool becomes more and more prominent as the child progresses through the grades.

To get an idea of the seriousness of reading disability in today's schools, one needs only observe or listen to the news media or educators as they present very alarming statistics. Some of the data reported may appear to be exaggerated or designed to shock us into

taking some drastic actions, however, the problem is serious enough to warrant dramatization. One of the most carefully conducted surveys indicating the seriousness of this problem was reported by Austin, Bush, and Huebner (1961). They found approximately 16 percent of children in grades three to nine was in need of special help in reading. Four-fifths of the 1300 disabled children in the study probably would have responded well to special instruction outside their classrooms but within their own school building. The other fifth needed special clinical diagnosis and intensive, and perhaps prolonged, remedial training. Harris (1961) estimated that between 10 and 15 percent of all elementary school children had reading disabilities.

There is not much agreement among authorities on the number of reading disability cases in the United States, however, by most indications the large number of reading disability cases is a serious problem and demands serious attention. According to Ruddell (1974):

> It has been estimated that one of every four students experiences reading retardation, and that about 50 percent of the pupils in large urban school systems reads below age-grade norms. About 15 percent of American adults reads at the fourth grade level or below, and an additional 25 percent fails to reach sixth grade standards. In other words, approximately 40 percent of American adults cannot function above the reading level we expect of the average twelve-year-old.

With inflation running rampant, budget cuts and layoffs affecting virtually all institutions of our society, educators are being forced to find alternative forms of manpower. At one time, teacher aides served as the alternative to the additional manpower needs; however, at this writing, even they are facing severe cutbacks. To deal effectively with this problem in the current milieu, some schools are resorting to all types of new programs which allow for some pupils to work independently while the teacher works with other children individually or in small groups. Some of these approaches have met with varying degrees of success while others have been miserable failures. At any rate, teachers do not have the time required to help these problem readers achieve appreciable gains in reading.

A practice which appears to be gaining popularity in reading circles is the use of tutors who may be parents, senior citizens,

classmates, upper-grade children, college students, and representatives of various civic and church organizations. After reviewing literature in the field of reading, Klosterman (1970) concluded that high school students, college students, and other interested persons are attempting to improve the reading abilities of children through tutoring programs. In a subsequent study, she found tutors to be valuable assets to a reading program, and quite capable of helping pupils improve their reading skills. McCleary (1971) also reported similar findings.

Tutoring appears to be beneficial not only to the pupil being tutored, but also to the the person doing the tutoring. McWhorter and Levy (1971) conducted a study on the influence of a tutorial program upon tutors. After analyzing the results, they concluded that the most significant result of the tutoring program is the improvement in the tutor's reading ability, which improved as much as or more than that of the children who were tutored. The tutors in their study were high school graduates enrolled in the Cooperative College Center of the State University College at Buffalo but not yet matriculated into the college. Each student tutored one primary level inner-city child for one college semester. The children who were tutored were in first, second, or third grade and all were experiencing reading difficulty.

The present study was designed to determine the effects that a university-based reading laboratory which utilized the tutoring approach would have on a school in meeting the needs of its problem readers.

Due to the cutbacks in manpower and the apparently increasing percentage of reading disability cases with which the typical classroom teacher has to cope, this study appears to be especially significant.

Program Design

This study was conducted in an elementary school whose pupils are predominantly black and from low socio-economic backgrounds. This school was selected for the study because of the administrators' expressed interest in finding ways to meet the needs of its problem readers. Participants in this study were third, fourth, and fifth graders who were experiencing reading difficulties as indicated by the *Metropolitan Reading Test* and verified by classroom teacher

observations. A total of fifty-nine subjects was used in the study. Each subject was randomly assigned to one of two groups. The groups were labeled as experimental and control. Thirty subjects were assigned to the experimental group and twenty-nine to the control group. At the end of the study, for various reasons, both groups had been reduced in size to twenty-five each.

The tutors were students majoring in elementary education at Florida A & M University. All tutors were enrolled in either the Foundations of Reading course or the Language Arts for Elementary Teachers course. A portion of most classes focused upon sound principles of teaching reading, diagnosis and remediation, and techniques of tutoring. Each tutor was assigned to one child and worked with the child for three sixty-minute sessions per week over a period of eight weeks.

Each subject in the experimental group was given individual diagnosis using the *Spache Diagnostic Scale* by trained reading specialists. On the basis of the subjects' performance on this test, remedial programs were developed. It was the tutor's responsibility to carry out the program for each child. In addition to being diagnosed by the Spache Scale, the experimental group was often tested by other tools if expected progress was not readily visible. Additional evaluative tools used were: the Keystone Telebinocular Vision Test (Keystone View Company), the Maico Audiometer (Maico Electronics, Inc.) the Wepman Auditory Discrimination Test, the Knox Cubes, Digit Spans, and various informal teacher-made instruments. Tutors were given training in using these various tools and were encouraged to conduct on-going diagnoses to help the child to solve his problems.

The tutors were supervised and assisted in locating materials two reading specialists. The materials used for the tutored group consisted of teacher-made games and materials, cassette recorders, workbooks, transparencies, trade books, basal readers, ditto masters, filmstrips, and experience charts and stories.

The present study was conducted during the spring quarter of the 1974-75 school year. The study began April 2, 1975 and ended June 5, 1975. During this time span each member of the experimental group had a total of twenty-four tutoring sessions. During the treatment period of this study, the control group received no special reading treatment from the tutors or any other person associated or involved with the study; however, they did continue to receive reading instructions from their classroom teachers.

Findings

A sharp 364-2 Programmable Calculator was used to perform the statistical *t*-tests using the scores from the *Metropolitan Reading Test*. Raw score differences between experimental and control groups on the pre-test, raw score differences between the pre- and post-test scores of the experimental group, and differences between post-test scores of the experimental and control groups were computed. The level of significance was set at the .05 level. Table 1 shows the pre-test means, standard deviations, and *t* for the experimental and control groups.

Table 1

PRE-TEST MEANS, STANDARD DEVIATIONS, AND t FOR EXPERIMENTAL AND CONTROL GROUPS

	Experimental	*Control*	*t*	*df*	*P*
Mean	*12.44*	*12.84*	*-0.36*	*48*	*N.S.*
S.D.	*3.69*	*4.18*			

As indicated by the *t* test, no significant differences were found between the pre-test scores of the experimental and control groups. The slight difference of the mean scores favored the control group. Table 2 shows the Pre- and Post-test scores of the control group.

Table 2

PRE- AND POST-TEST SCORES OF CONTROL GROUP

Post-test mean score	*15.64*	*t - 4.94*	*P - 0.001*
Pre-test mean score	*12.84*		
Mean difference	*2.80*		

Comparison of the pre- and post-test scores of the control group indicates that the control group made significant growth over the eight-week period without the benefit of tutoring. Pre-test mean of the control group was 12.84, and the post-test mean of the control group was 15.64. The mean difference of these scores was 2.80, and was significant at the .001 level. Table 3 shows the Pre- and Post-test scores of the experimental group.

Table 3

PRE- AND POST-TEST SCORES OF EXPERIMENTAL GROUP

Post-test mean scores	*19.24*	$t = 7.74$	$P = 0.001$
Pre-test mean scores	*12.44*		
Mean difference	*6.80*		

Comparison of the pre- and post-test scores of the experimental group shows that the experimental group made significant gains over the eight-week period. This group had benefit of the twenty-four one-hour tutoring sessions. Pre-test mean of the experimental group was 12.44, and the post-test mean of the experimental group was 19.24. The mean difference of these scores was 6.80, which was significant at the .001 level. Table 4 shows the post-test means, standard deviations, and *t* score for the experimental and control groups.

Table 4

POST-TEST MEANS, STANDARD DEVIATIONS, AND t FOR EXPERIMENTAL AND CONTROL GROUPS

	Experimental	*Control*	*t*	*df*	*P*
Mean	*19.24*	*15.64*	*2.35*	*48*	*.05*
S.D.	*5.29*	*5.51*			

The *t* statistic computed between post-test scores of the experimental and control groups indicates a significant difference favoring the experimental group at the .05 level. The mean difference between the test scores was 3.60.

Conclusions

This study has revealed that the children participating in this study profited significantly from the type of tutoring program provided. It would appear that this may be an avenue which may be taken by teachers in order to meet the needs of those pupils whose reading levels prevent them from profiting from regular classroom instruction. There are also strong indications that one need not be a reading expert or specialist in order to help another learn to read. Literature in the field of reading contains documented evidence that laymen have been able to influence significantly children's ability to read. Tutors for this study could not be classified as typical laymen because they are pre-service teachers, but most had not yet become proficient in many of the skills and experiences one would expect a classroom teacher to possess. These pre-service teachers were able to effect significant growth for problem readers in the short eight-week period. Considering the results of this study and others similar to it, educators would do well to explore this practice as a viable alternative to supplementing the manpower shortage.

This study did not include an objective statistical analysis of the effects of tutoring on the tutors participating in this study, but through informal observations several behavioral changes were seen and heard. In prior reading and language arts courses, students often complained that the theory being presented was not very meaningful to them because they didn't understand how to apply it. After the eight weeks of tutoring, almost all tutors indicated that tutoring was a meaningful experience and that students enrolled in the courses subsequently could profit from such an experience.

Based on direct observations, examinations, and discussions, the researcher has no doubt that these students as a group have a better grasp of reading methods and techniques than those students enrolled in prior classes. This experience was not one of all successes. Just as there were feelings of success, pride, and

accomplishments, there were also instances of failure and frustration; however, the tutors detected that learning to read is a complicated and long-term process. Most settled down, worked patiently, conscientiously, and gained valuable insights into teaching reading.

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A STUDY OF THE EFFECT OF THE THIRTEEN-COLLEGE CURRICULUM PROGRAM PHYSICAL SCIENCE COURSE ON THE SCIENTIFIC ATTITUDE OF COLLEGE STUDENTS

by Melvin F. Gadson

The Problem

This study was designed and conducted to determine if one complete term of study (fall quarter, 1973) effected a significant difference in the emotional, intellectual, and total scientific attitude between those college students enrolled in Thirteen-College Curriculum Program (T-CCP) physical science and those enrolled in traditional physical science at the Florida Agricultural and Mechanical University.

The Hypotheses

Nine null hypotheses were formulated to test the effect of the methodology (T-CCP physical science and traditional physical science) on the emotional, intellectual, and total scientific attitude of college students. They were:

Hypothesis one. There is no significant difference in the emotional scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis two. There is no significant difference in the intellectual scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis three. There is no significant difference in the total scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis four. There is no significant difference in the emotional scientific attitude of college male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis five. There is no significant difference in the intellectual scientific attitude of college male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis six. There is no significant difference in the total scientific attitude of College male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis seven. There is no significant difference in the emotional scientific attitude of college female students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis eight. There is no significant difference in the intellectual scientific attitude of college female students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

Hypothesis nine. There is no significant difference in the total scientific attitude of college female students between those enrolled in T-CCP physical science and those enrolled in traditional physical science.

The Methodology

The Scientific Attitude Inventory was administered to 242 undergraduates, the majority of whom were freshmen, enrolled in the T-CCP physical science course and the traditional physical science course at the Florida Agricultural and Mechanical University at the beginning of the fall quarter (pre-test), 1973. The inventory was again administered to the same group of undergraduates at the end of the fall quarter (post-test), 1973, but the number of subjects had decreased from 242 to 192, a loss of 50 subjects. This loss was due to either withdrawal from the course, absenteeism on the day of the administration of the post-test, or the computer program for the experimental design of the study (two-way analysis of variance) which required equal cell size. In this study, 4 cells were utilized with 48 subjects in each cell, making a total of 192 subjects for the experiment.

The scores used were the totals of 60 items of the *Scientific Attitude Inventory* assessing each of the emotional, intellectual, and total scientific attitude of college students. This produced two scales with a possible minimum score of (0) and a possible maximum score of 120 for (1) the emotional scientific attitude scale and, (2) the intellectual scientific attitude scale. This also produced a third scale with a possible minimum score of zero (0) and a possible maximum score of 240 for the total scientific attitude scale.

The data analysis consisted of a one-way analysis of variance on the emotional, intellectual, and total scientific attitude pre-test scores according to sex to determine if homogeneity existed between the two groups at the beginning of the fall quarter, 1973. The results of the one-way analysis of variance indicated that the two groups were homogeneous. The post-tests of both groups were subjected to a two-way analysis of variance (treatment and sex) on the emotional, intellectual, and total scientific attitude scores to determine statistically significant relationships.

The analysis of variance calculations was performed using the IBM 370-145 computer system at The American University utilizing the One-way Analysis of Variance Program and the Analysis of Variance for Factorial Design Program designed by W. J. Dixon of the University of California, Los Angeles, California.

Findings and Conclusions

The problem considered in this study was the following: At the end of one complete term of study (fall quarter, 1973), was there a significant difference in the emotional, intellectual, and total scientific attitude between those enrolled in T-CCP physical science and those enrolled in traditional physical science? The findings are presented below.

1. There was a significant difference in the emotional scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science, and this difference provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive emotional scientific attitudes is concerned.

2. There was a significant difference in the intellectual scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science, and this difference provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive intellectual scientific attitudes is concerned.

3. There was a significant difference in the total scientific attitude of college students (male and female combined) between those enrolled in T-CCP physical science and those enrolled in traditional physical science, and this difference provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive total scientific attitudes is concerned

4. There was a significant difference in the emotional scientific attitude of college male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science; however, there was no significant interaction effect between treatment and sex. The significant difference found provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive emotional scientific attitudes is concerned.

5. There was a significant difference in the intellectual scientific attitude of college male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science; however, there was no significant interaction effect between treatment and sex. The significant difference found provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive intellectual scientific attitudes is concerned.

6. There was a significant difference in the total scientific attitude of college male students between those enrolled in T-CCP physical science and those enrolled in traditional physical science; however, there was no signifcant interaction effect between treatment and sex. The significant difference found provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive total scientific attitudes is concerned.

7. There was a significant difference in the emotional scientific attitude of college female students between those enrolled

in T-CCP physical science and those enrolled in traditional physical science; however, there was no significant interaction effect between treatment and sex. The significant difference provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive intellectual scientific attitudes is concerned.

8. There was a significant difference in the intellectual scientific attitude of college female students between those enrolled in T-CCP physical science and those enrolled in traditional physical science; however, there was no significant interaction effect between treatment and sex. The significant difference provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive intellectual scientific attitudes is concerned.

9. There was a significant difference in the total scientific attitude of college female students between those enrolled in T-CCP physical science and those enrolled in traditional physical science; however, there was no significant interaction effect between treatment and sex. The significant difference found provided definite support for the inference that the T-CCP methodology is superior to the traditional methodology as far as developing positive total scientific attitudes is concerned.

Discussion

The findings of this study indicate that the students who were enrolled in the T-CCP physical science course exhibited a more positive attitude toward science at the end of the fall quarter, 1973, than the students who were enrolled in the traditional physical science courses. This statement is supported by the fact that, in every instance, higher mean scores for members of the experimental group, whether they were males, females, or males and females combined. In addition to higher means, there were significant differences in mean scores for treatment and sex; however, there were no significant interaction effects between treatment and sex.

The nature of this investigation yielded conclusions about the superiority of a particular methodology (T-CCP physical science) over another methodology (traditional physical science) for

developing positive emotional, intellectual, and total scientific attitudes within college students. The reader should remember that constraints did not permit subjects to be randomly assigned to treatment groups; however, this factor was corrected by establishing homogeneity between the two groups. The reader should also remember that the quantitative observations made in this experiment were dependent upon several extraneous variables which may not have been adequately controlled; this limits the generalizability of specific conclusions. The extraneous variables obvious in this study were (a) non-randomized sample, (b) mortality rate, (c) the Hawthorne Effect, and (d) three of the four professors of the control group were non-black and both members of the experimental group were black. To minimize the influence of the non-randomized sample, a pre-test was given and a one-way analysis of variance was applied on the pre-test scores to determine if the subjects of the experimental and control groups were significantly different from each other. The results of the pre-test revealed that the two groups were homogeneous.

Fifty subjects were lost from the administration of the pre-test to the post-test. Sixteen were lost because of either withdrawal from the course or absenteeism on the day of the administration of the post-test. Thirty-four subjects were randomly eliminated from the study using a table of random numbers in order to meet the specification of the experimental design, two-way analysis of variance, which requires equal cell size.

To minimize the influence of the Hawthorne Effect, the subjects were not made aware as to whether they were members of the experimental or the control group. Subjects responded to similar inventories, and no inventories were labeled "experimental" or "control."

Administrative regulations made it impossible to assign professors to either the experimental or the control group based upon race. This resulted in two black professors teaching the experimental group and three non-black professors teaching the control group. Ideally, the race of the professors should be constant or evenly matched between both groups so that the difference found, if any, could not be attributed to the race of the professors.

It is noted here that every value for treatment and sex is highly significant at the .05 level (p .05); which indicates that the students who were enrolled in the T-CCP physical science exhibited

a more positive attitude toward science than those enrolled in traditional physical science at the end of the fall quarter, 1973. This might be attributed to the fact that the students realized that they were participating in an experiment and they accordingly responded favorably (The Hawthorne Effect). Another possible reason for this might still be attributed to various extraneous variables, as referred to earlier, that are characteristic of educational experiments, even though efforts were made to neutralize the influence of many and identify the others.

Finally, although the Hawthorne Effect and other extraneous variables may have affected the results of this study, the data suggest that the T-CCP physical science course can affect the emotional, intellectual, and total scientific attitude of college students in a positive manner.

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TEACHER EDUCATION:

A STATUS REPORT

by Paul Mohr

Shifting enrollment trends in black colleges, coupled with a so-called teacher surplus, have provided an impetus for many teacher educators in the black colleges to engage in short-range and long-range planning to accommodate the aforementioned factors. An initial step in the planning process was to gather whatever baseline data were available.

Fortunately, the American Association of Colleges for Teacher Education (AACTE) and the Teacher Programs and Services (ETS) jointly sponsored in 1973, a national survey of pre-service teacher education programs in which the AACTE member institutions included programs in 31 black institutions.

The purposes of the survey were:

1. to provide the most current information on undergraduate teacher education curricula: course hours, subjects, programs, etc.
2. to gather information on the changes and new directions evolving in teacher education programs on the campuses.
3. to gain a sense of national academic opinion on the selection and certification of teachers.
4. to indicate directions for further studies in this area.

In an effort to get a more specific profile of teacher education programs in the sampled black institutions, the writer requested data on these institutions and ETS graciously fulfilled the writer's request.

SURVEY RESULTS

Institutional and Student Characteristics

Of the 31 black institutions included in the sampling 61.3% was representatives of the private sector and 38.7% was from the

public sector. Relative to undergraduate population, more than half of the institutions had total undergraduate enrollments ranging from 1,000-2,599 students. Another 29% represented institutions with enrollments between 501-999. Thus, 80% of the respondents reported enrollments ranging from 501-2, 599 with only 13% having an enrollment range of 5,100-10,999.

According to the respondents, the semester system is the more popular one, 77% indicating that this was the calendar system used. Only 12% reported they were on the quarter system.

Relative to the percentage of undergraduate population enrolled in teacher training, 67.7% of the respondents indicated that 50% or less are enrolled in teacher training, while the total universe sampled reported 78%. It is interesting to note, however, that 13% of the black colleges reported an enrollment in teacher education of more than 75% while for the entire sampling, only 4.5% reported a similar response.

The ETS researchers requested information on the total number of teacher education undergraduates and found that the average enrollment was 725, with female students averaging 414 and males - 259.

Program Characteristics

Teacher education programs formally begin in the junior year for 52% of the respondents as compared to the 39% who indicated that their programs begin in the sophomore year. For the total sampling, however, more programs begin in the sophomore year than in the junior year.

Of the 16 specific subjects listed in the area of general education on the ETS survey, black institutions had a higher percentage of requirements. For example, for elementary education majors 100% required mathematics; 97% - biological science; 94% - history; 94% - physical science; art, music and psychology were other subjects which at least 80% of the institutions listed as requirements. These percentages are greater than those reported overall: mathematics - 82%; biological science - 70%; health-physical education - 76%; history - 75%; and physical science - 94%.

Similar information was not available for supporting general education requirements. However, one can conclude that requirements for both elementary and secondary majors are similar.

In response to the item, course hours in general education for teacher education majors, 45% of the institutions indicated the required number of hours ranged from 46-60 for all teacher education majors.

More than half (58%) of the black institutions indicated that the required number of hours has remained the same in the past three years while 39% indicated a decrease. Forty-eight percent indicated that in the next three years the requirement would remain the same; almost one-third felt there would be a decrease. It is significant to note that more than two-thirds of the white institutions felt that their requirement would remain the same, and 19% felt there would be a decrease.

Information on the two major components of professional education, curriculum and instructional methods, and field experiences was sought and differences in requirements for elementary and secondary majors were detected. Forty-two percent of the institutions indicated that 16 or more hours are required for elementary education majors while only 9% had a similar requirement for secondary majors. For field experiences 30% required 10 or more hours for elementary majors and only 19% had a similar requirement.

Almost 40% of the respondents indicated that the total number of hours required in professional education had increased in the past three years while 84% indicated that the requirement will probably remain the same for the next three years.

Relative to Materials/Techniques, black institutions are no different than any other institution in the use of computer-assisted instruction (CAI). Most institutions do not use CAI in teacher education, and less than 10% of all institutions makes moderate use of CAI.

Individualized instruction has gained greater acceptance in black institutions in that 84% reported moderate use while only 63% of the white institutions had a similar response.

The traditional techniques, seminars and lectures are still popular with all institutions. Micro-teaching is used by 52% of the

black institutions while 76% of the white institutions indicated use of this technique. There is some use of modules and mini courses as well as simulation and video tapes in both groups of institutions—black and white. Use of the materials/techniques vary according to the different teacher education programs in these institutions.

Participation in class discussion is considered as a very important criterion for evaluating students in professional education courses, according to 77% of the black institutions. Only 44% of the white institutions felt participation is very important. Both groups of institutions placed significance on scores of tests as might be expected.

Performance on pre-determined behavioral objectives was considered to be either very important or moderately important 94% of the black institutions, a somewhat higher response than their counterparts reported—83%. However, this is indicative of the two groups in institutions seeking innovation in professional education courses consistent with the trends.

Scores on tests received a low response from both groups of institutions, indicating, perhaps, a greater emphasis on actual performance rather than this kind of pen and paper performance.

A question concerning participation of students in field experiences resulted in responses indicating that while student teaching largely remains a senior year experience for all institutions, some classroom observations and tutoring take place during the freshman year. A distinguishing feature about black colleges is that they offer more community experiences from the freshman year through senior year. These institutions also compare rather favorably with other institutions in offering teacher aid experiences.

Information was solicited on the following programs of special needs that are offered or being planned: open classroom, urban education, bilingual education, learning disabilities, education of the disadvantaged early childhood (pre-school). Bi-lingual education received the lowest number of responses (24%) from either group of institutions, while early childhood education, considered to be separate from elementary education, received a large number of responses from all institutions (76%).

Learning disabilities, considered to be a relatively new field, received a large number of responses overall, 66%, however, only 42% of the black institutions indicated that they either had such a program or that they plan to offer the program. Urban education and education for the disadvantaged were listed as having significant emphasis for all institutions.

The trend toward individualized needs is discernible in all colleges and universities. A majority of the institutions reports that a student can prescribe to some degree his/her own program either in all teacher education programs or in some teacher education programs.

Some new directions in teacher education were further discerned because of the emphasis on multiple field experiences, teaching centers and in-service workshops. However, responses from black colleges indicate a need for greater inclusion of multiple field experiences and teaching centers in their programs.

While an overwhelming majority of institutions (87% black, 72% white) is planning a performance-based program, fewer institutions (26% black, 17% white) have an experimental undergraduate teacher education program running parallel to their major program.

Admission Requirements Into Teacher Education

A response to the question on admission requirements shows that many institutions emphasize a minimum grade point average (74% black colleges, 88% white colleges) and recommendations for entry (61% and 73% respectively).

More than 50% of the institutions requires interviews.

Less than 20% of all institutions requires: aptitude measures, achievement tests, attitudes and interest measures and personality tests. Asked the question about the desirability of any of the admission measures, less than 20% of the entire sampling checked any single measure.

The education faculty members are the ones most involved in the student selection process for teacher training (85%); while

college administrators are least involved (18%) as one would expect. It is interesting to note that faculty advisors are used less (41%) than faculty "other than education faculty" (50%).

Major characteristics of the student selection process in all institutions are a selection committee (70%) and written policies (62%). A few institutions (6%) indicated they had no selection process.

Graduation Requirements

As expected, the survey revealed the following as major criteria of all institutions for graduation from teacher education programs: minimum hours, minimum overall grade point average in the education sequence, minimum performance in student teaching and supervisors' evaluations. By and large, black colleges, compared most favorably with their white counterparts.

General Information

Of the criteria used to evaluate the effectiveness of teacher education programs, faculty performance measures by students, follow-up studies of graduates and faculty review of the curriculum, appear to be the major criteria for the overall sampling. However, only 55% of the black colleges uses faculty performance meansures by students in comparison with 80% of their white counterparts. The significance of follow-up studies of graduates is also less in black institutions (71%) than in white institutions (85%). Relative to how follow-up studies of graduates are done, it is significant to note that opinions of administrators in hiring school districts is almost as widely sought (77%) as the opinions of graduates (79%) for all institutions.

When asked with which groups the institutions would be interested in having data to compare graduating seniors, the greatest interest expressed by the black colleges was with similar institutions (96%) while white colleges indicated less interest (78%). The black colleges also preferred a regional comparison (71%) while 59% of the white institutions similarly responded.

Comparison with a national sample of teacher education graduates appeared to be least desirable for black (58%) and white institutions (56%).

Ninety percent of the black institutions responded that a state approved teacher education program should be the basis for states to grant teaching certificates, while only 76% of the white institutions had a similar viewpoint. Opposite views are apparent relative to NCATE because only 19% of the respondents in black institutions checked graduation from an NCATE approved institution while 46% felt that NCATE approval is a good basis for granting certificates.

Additional certification requirements included a demonstrated minimum knowledge criterion and a demonstrated performance criterion.

Within the knowledge criterion, mastery of the subject area was listed as most significant of the three components: subject area, professional education and general education. General education was considered least significant of the three.

Within the performance criterion, respondents expressed preference for observing teaching activities by their personnel rather than by school system personnel.

The final item on the survey solicited responses relative to services that ETS could possibly provide to the institutions such as standardized candidate profiles, guidance packages, program validation, and evaluation of student teaching on a state-wide criterion-referenced basis. Black colleges expressed a great preference (87.1%) for program validation in which elements of the teacher education program could be compared with knowledge and/or performance judged significant in teaching. Seventy-three percent of the white colleges saw this as a valuable service.

Standardized candidate profiles were of some interest (71% and 60%, respectively). Of less interest were guidance packages for students that included materials on self-selection and orientation to teacher training and teaching.

Summary

It was the purpose of this report to look at the status of teacher education in black colleges in order to have appropriate information by which long-range and short-range planning can be more effective. There is no question that there are certain limitations of this report. However, the collaborative efforts of ETS and AACTE in conducting the study and in making the data available suggest that there is sufficient reason to accept the credibility of the findings.

The results of the survey seem to indicate that teacher education programs in black colleges are well within the mainstream of all teacher education programs. One may reason that this is the result of historical fiat because these institutions have had as a major thrust teacher education. Others may contend that faculty status and professional affiliations can account for this. Another reason may be productivity factor in which thousands of graduates have distinguished themselves not only in a dual school system but also in a so-called unitary system.

While a superficial glance at these teacher education programs shows them as emulating programs of the past two decades, there are some visible changes that have taken place and there are some characteristics that distinguish these programs from others.

For example, black colleges have more requirements for the general education component. Limited skills of entering students may partially account for this. Also, tradition may play a large role in that these institutions may be retaining a component almost in toto due to a "liberal arts" syndrome. The matter of "limited skills" does not necessarily mean that students are products of segregated schools, per se. The so-called desegregated schools have not done as much as is expected in preparing minorities for post-secondary education. The whole matter of limited skills is placed in proper perspective when one realizes that many high school graduates are entering colleges with deficient academic backgrounds.

For Material/Techniques, the black institutions appear to be doing a commendable job in individualizing instruction. This seems most appropriate in light of the clientele that they have

traditionally served and also because of an increasing enrollment of non-minorities. Thus, the teacher education programs appear to lend themselves to a modicum of flexibility that includes an acceleration mechanism for those students who enter and progress through the programs with sufficient skills. The reader should note that individualized instruction is a strategy contained more so in the professional education component than in general education. The former is normally structured by the education faculty; the latter is controlled on a college or university-wide basis. Even with rigid general education requirements, one would assume that the College Level Entrance Examinations (CLEP) provide an acceleration mechanism that should be utilized.

Another distinguishing feature about the black institutions is their reliance upon performance of students on pre-determined behavioral objectives as a means of evaluating students in professional education courses. Ninety-four percent of these institutions considered such an evaluation criterion as either very important or moderately important with 55% considering the criterion very important. As Susan Sherwin observed in her report, such a response indicates "...an awareness and acceptance of relatively new ways to formulate the components of a teacher education program." Such a criterion also adds to the reality base of teacher education in that the emphasis is on practice rather than theory. This criterion is also indicative of consistency and continuity with major trends in teacher education, one of which is competency-based teacher education.

Another criterion that black college teacher education programs respond to rather admirably is that of participation in class. Eight-six percent view this as either very important or as moderately important while less than 50% of their counterparts attached similar significance to such a criterion. With the teaching profession being an active, participatory kind of profession, such a criterion gains added significance.

With reference to field experiences, the survey results indicate that black colleges offer more opportunities for community experiences. An analysis of the data reveals that this is true for each of the four years that a student is in a teacher education program. Black colleges have always had a strong linkage with their communities and recent societal demands have forced these

institutions to be more responsive to community needs than Harvard. With respect to the former, the community embraces the common man, while the latter embraces the community of scholars.

Despite the fact that the black colleges seem well within the mainstream of teacher education and that there are some distinguishing features worth of emulation, there are some areas of concern that these institutions should address—one is a matter of credibility via accreditation. The visibility of these institutions can be enhanced immeasurably if they attain approval beyond the state and regional levels. Very few of the institutions view a national accrediting agency such as NCATE as having significance when it comes to the granting of certificates. NASDTEC is similarly viewed by these institutions.

Part of the responsibility for establishing greater credibility for these institutions and their programs should also rest with agencies such as NCATE. They too have a professional responsibility to provide the leadership in making sure that respectable programs have the appropriate seal of approval.

With respect to the teacher education programs, it was observed that very few black institutions offer programs focusing upon the open classroom concept and learning disabilities. While many field experiences are conducted in open classroom settings, pre-service and in-service programs can be enhanced if the black institutions placed more emphasis on the open classroom throughout the teacher education program, rather than in one particular component.

Some reasons why black colleges have not emphasized learning disabilities are:

1. Specific learning disabilities is a relatively new development. As such, it takes time for it to become institutionalized.

2. The close proximity of predominately black colleges and universities to white ones and the concern of state university system regulations and policies concerning the addition of new programs and the duplication of courses and programs.

3. The lack of adequate teaching personnel with training in specific learning disabilities.

4. The lack of adequate funding for additional personnel and instructional support for courses or programs in specific learning disabilities.

5. Lack of cooperative efforts on the part of school systems and colleges and universities in structuring programs for in-service teachers.

7. The exclusion of specific learning disabilities in state certification requirements.

The matter of learning disabilities is especially critical when one recognizes that a high percentage of public school pupils are placed in this category. In Florida alone, during 1973-74 there were almost as many in this category (19,043) as there were in the "gifted" category (20,603). In addition, 2,569 pupils were on a waiting list hoping to gain the services of the public school systems. Finally, two other concerns surfaced as a result of the survey. One is that admission requirements should be reviewed with some consideration being given to increasing the minimum GPA. Secondly, greater utilization of student ratings should be used by the black institutions for evaluating the effectiveness of their teacher education programs. To do so would enable these institutions to strengthen program planning.

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